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Raging Poverty and Agricultural Output in Nigeria: An Empirical Investigation

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Abstract
The contribution of agriculture to poverty reduction is a well-known fact following the experience of certain economies around the world. Majority of these economies falls within the developed countries where a substantial percentage of their agricultural products is imported from developing nations. In this light, as Nigeria is an agrarian economy with increasing level of poverty, this study empirically investigates the impact of agricultural sector on poverty reduction in the country over the period 1986 to 2012. Among econometric techniques employed for the research, the error correction mechanism (ECM) model reveals that food production index and government spending had negative impact on poverty headcount ratio in the country.
Keywords: Agriculture; Poverty headcount ratio; food production index; GDP per capita; ECM; Nigeria
JEL Classification: I32

1.Introduction

Agriculture is very important to all countries in the world. It is, however, more important in developing nations because of the numerous roles it plays in the community, providing employment to a larger proportion of the populace than in industrial nations. A significant phenomenon is that fragile and difficult environments characterize third world agriculture (Chambers, Pacey & Thrupp 1989). In most poor countries, especially in sub-Saharan Africa, large majorities of the population live in rural areas and earn their livelihoods primarily from agriculture. Apart from Northern Africa and Southern Africa, the remainder of the continent's population and workforce are heavily agricultural, with approximately 60 percent of the economically active population in agriculture. As a result, any serious discussion of growth and poverty reduction in Africa must begin with a look at the role played by agricultural development (see Gollin 2009). In the Brundland Commission categorization of agricultural systems, sub-Saharan African agriculture belongs to the Low Resource or Resource-Poor Agriculture which is also characterized by a preponderance of small farm units, fragile soils, rain-dependent, has minimum inputs and poor yields (see Okuneye, Fabusoro, Adebayo & Ayinde 2005).

Agricultural sector of a less-developed country plays a paramount role in the physiology of the economy, but more importantly, the sector is required to play a critical role in the development pace and pattern of the country. As food security is a strategic development objective for long-term survival of the nation, then the agricultural sector has to play the critical role of supplying relatively cheap food to the urban industrial sector to check inflationary tendencies of workers' wages where inadequate food availability leads to rising food prices and consequent industrial unrest as workers intermittently demand for upward review of minimum wage to meet basic needs. In addition, food importation is not a viable option in a situation of foreign exchange scarcity and so agricultural sector's food supply to urban industrial sector becomes inevitable. In many African countries, poverty is not only widespread but also severe and deep. One of the lessons of history is that poverty cannot be reduced except there is growth in the economy. Thus, economic growth is important for sustained progress on poverty reduction. Empirical evidences show that countries that have reduced poverty are the ones that have grown the fastest. Poverty, on the other hand, has grown fastest in countries that have stagnated economically.

In Nigeria, the agricultural sector accounts for 47 per cent of gainful employment in 2005 with 41 per cent of the share of GDP as against much higher figures in the 1960s and early 1970s prior to the oil boom. In an attempt to correct this trend, the civilian administration in the period 1999-2007 desired to restore the sector to its pre-oil boom era pre-eminence by anchoring its poverty alleviation programme on the revival of agriculture. Meanwhile, the World Bank Development Report (2000/2001) opines that the Nigerian figure for the GDP share of agricultural sector is quite on the high side when compared with the average of 27 per cent for low-income nations, or the average of 18 per cent for sub-Saharan Africa. But, according to Iwayemi (2012) there is declining well being and rising poverty level as the impressive and sustained growth has failed to translate into poverty reduction, inclusive growth and development. This observation is substantiated by the significant deterioration in economic prosperity for much of the population based on poverty level and other human development indicators. Also, despite this seemingly positive trend in agricultural sector performance, the trend in national absolute poverty based on food energy intake method of analysis according to Aigbokhan (2000) and Federal Office of Statistics (now National Bureau of Statistics) (2005), increased from 0.38 in 1985 to 0.54 in 2004. In the same periods, urban and rural absolute poverty also increased from 0.38 and 0.41 to 0.42 and 0.63, respectively. Thus, the total population in poverty rises to 68.7 million in 2004 from 18.26 million in 1985. Also,

as a composite measure of income and access to education and health services, the Human Development Index (HDI) ranked Nigeria 154th out of 179 countries in 2006 (see UNDP, 2004 & 2007/2008). And the National Household Survey conducted in 2005 also showed that 51.6 per cent of the Nigerian population live in poverty (FOS, 2005). Yet, the total agriculture GDP which was 97.4 billion in the 1980-1989 period, increased tremendously to 206.8 billion in the 2000-2006 period.

Over the years, in an attempt to reduce the level of poverty and increase the rate of economic development, Nigeria has embarked on several strategies which include National Poverty Eradication Programme (NAPEP), National Economic Empowerment and Development Strategy (NEEDS), VISION 2010, and the newly introduced Financial System Strategy (FSS) 20:2020 and Subsidy Re-investment Programme (Sure-P). Yet, regardless of these strategies and despite NEEDS targeted poverty reduction at 5 per cent yearly from 2003 through 2007, NBS (2011) reports showed that 93.9 per cent Nigerians are poor as the country's poverty rate stood at 69 per cent in 2010 reflecting that the figure was higher than the 54 per cent recorded in 2004.

Many studies, including Okunneye et al (2005) and Nwafor, Eboh, Chukwu & Amuka (2011), have examined the impact of agriculture on poverty in Nigeria. The conclusion has always implied that poverty is a scourge that has refused to leave the country despite the various efforts of the government. In this light, the present study finds necessity to contribute to the discussions by extending the research scope to cover the recent efforts by government to better the well being of the citizens of Nigeria. It therefore explores the effects of food production index and GDP growth rate on poverty headcount ratio of population living below USD 1.25 per day.

Essentially, the significance of this study also premised on the desire of Nigeria to effectively combat poverty with a view to attaining the Millenium Development Goals (MDG) by 2015. Thus, despite the various poverty alleviation strategies that have been introduced and implemented, yet the country needs a policy measure that will aim at improving the living standard of the people and improve the growth rate of per capita income necessary for poverty reduction. Since it is imperative that agricultural sector propels growth in the developing countries along the thought of Sen (1985; 1986; 1989; 1999), it is worthwhile to examine the extent to which the sector has helped in reducing poverty and transformed the lives of the average poor in Nigeria.

The rest of the paper continues with section two presenting the stylized facts on government's efforts at reducing poverty in Nigeria; Section three briefly discusses theoretical and empirical literature; as conceptual framework and methodology is presented in the fourth section; Empirical results are analysed and discussed in section five; while the sixth section gives concluding remarks and recommendations.

2. Stylized Facts

2.1 Overview of Poverty Incidence in Nigeria

Nigeria's prospects of halving poverty by 2015 seem weak. The proportion of people living below the national poverty line worsened from 65.5 per cent in 1996 to 69.0 per cent in 2010. Rates of poverty also vary significantly between urban and rural citizens and among the geopolitical zones: it was higher in rural areas (73.2 per cent) than in urban areas (61.8 per cent). As depicted in Table 2.1 below, the national poverty incidence figure was 28.1 per cent in 1980 against a higher incidence of 54.4 per cent recorded in 2004. Further, in 2010 the North-West and North East geo-political zones recorded the highest poverty rates in the country with 77.7 per cent and 76.3 per cent respectively. South-West geo-political zone recorded the lowest with 59.1 per cent, and among the states from the North-West and North- East geo-political zones, Sokoto had the highest poverty rate with 86.4 per cent in 2010 against 95 per cent recorded by Jigawa in 2004. Niger had the lowest with 43.6 per cent in 2010 against 22 per cent recorded by Anambra in 2004. In addition, Nigerians who had minimal standards of foods, clothing, healthcare and shelter stood at 60.9 per cent in 2010 as against 54.7 per cent recorded in 2004. The federal capital territory (FCT) with 97.9 per cent, recorded the highest number of people, who considered themselves to be poor, while Kaduna with 90.50 per cent, recorded the least number of people. The income inequality in the country as measured by the Gini-Coefficient rose from 0.429 in 2004 to 0.447 in 2010.

Table 2.1: Poverty Incidence in Nigeria, 1980-2010

Analytical Categories	1980	1985	1992	1996	2004	2010
North-East	35.6	54.9	54	70.1	72.2	76.3
North-West	37.7	52.1	36.5	77.2	71.2	77.7
North-Central	32.2	50.8	46	64.3	67	67.5
South-East	12.9	30.4	41	53.5	26.7	67
South-West	13.4	38.6	43.1	60.9	43	59.1
South-South	13.2	45.7	40.8	58.2	35.1	63.8
Urban	17.2	37.8	37.5	58.2	43.2	61.8
Rural	28.3	51.4	46	69.3	63.3	73.2
National	28.1	46.3	42.7	65.6	54.4	69

Source: National Bureau of Statistics, 2011

2.2 Government's Support and Contribution of Agricultural Sector to GDP

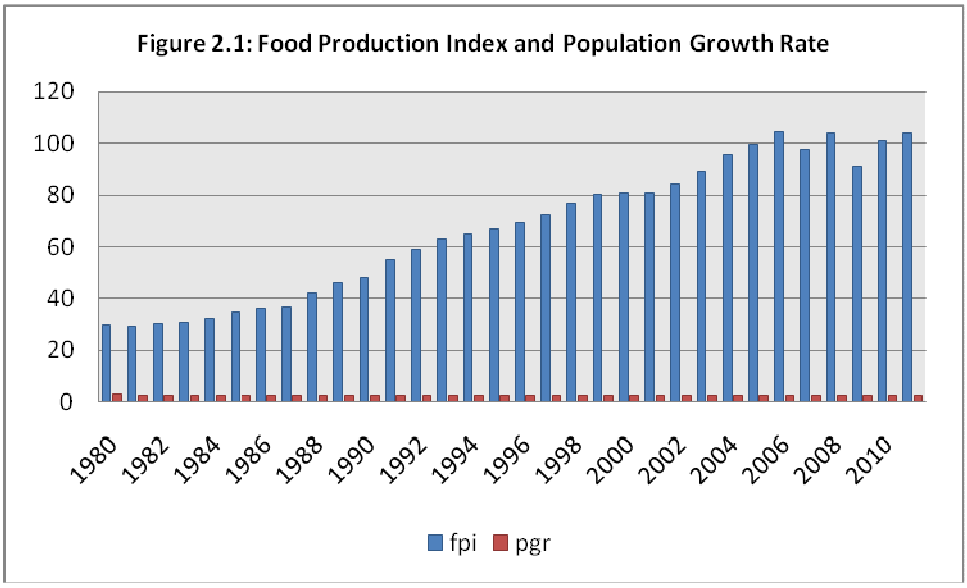
Intervention in the agricultural sector by the federal government was informed mainly by the necessity to eradicate poverty in the country. This objective was intended to be achieved through national food security as a way to ensuring sustainable access to, and availability of affordable good quality food for all Nigerians. In addition, the government aimed at the production of agricultural raw materials for the industrial sector and the export market, promotion of the value-chain approach in the agricultural sector, and enhancement of farm income. In essence, government persists in the provision of support to farmers under the Fertilizer Market Stabilization Programme. Part of the supports was the sum of ₦22.30 billion (out of ₦89.31 billion) as its 25 per cent subsidy contribution to the procurement and distribution of 900,000 tonnes of fertilizer to the states and the Federal Capital Territory (FCT). Also, the budgetary allocation from the federal government to the sector increased from ₦35.8 billion in 1990 to ₦51.47 billion in 2001. In the same vein the total credit made available by the banking sub-sector to the agricultural sector increased from ₦89.9 million in the period 1970-1979 to around ₦262,075 million in 2005.

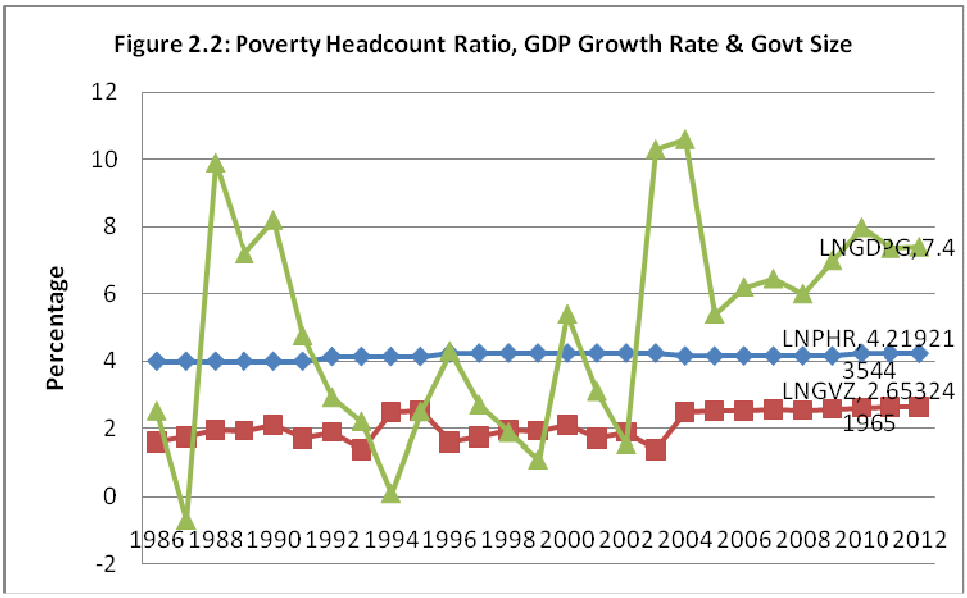
Table 2.2: Growth in the Agriculture Sector's Percentage Contribution to GDP, 2000-2011

Year/Category	2000	2001	2002	2003	2004	2005	2006	2007	2008	2010	2011
Crop	22	28.5	29.2	29.06	30.48	29.02	28.5	29.55	27.45	36.4	35.83
Livestock	2.6	3.3	3.4	2.04	2.14	2.15	2.04	2.1	2.02	2.61	2.58
Forestry	0.5	0.6	0.6	0.14	0.45	0.42	0.4	0.4	0.4	0.52	0.51
Fishery	1.2	1.6	1.7	1.09	1.14	1.17	1.06	1.09	1	1.34	1.32
Total	26.3	34	34.9	32.6	34.21	32.76	32	33.15	30.87	40.87	40.24

Source: Central Bank of Nigeria, 2011

Essentially, the period 1999-2007 witnessed an increase in credit to the agricultural sector due to the various mechanisms put in place by the government to provide credit to the farmers. Such mechanisms include the Presidential Initiatives and the Agricultural Credit Support Scheme (ACSS). Access to affordable credit continued to receive attention as the CBN monitored and encouraged the disbursement of funds under the ₦200 billion Commercial Agricultural Credit Scheme (CACS). As at December 2010, the Bank had released ₦96.81 billion to eleven participating banks for disbursement to 86 projects/promoters which included eighteen state governments.





Source: Author's representation with underlying data from Food and Agriculture Organization, United Nations Population Division, World Bank national accounts data, and OECD National Accounts data files.

Analysis of the National Accounts of Nigeria shows that the agricultural sector's share of GDP registered an average of 37 per cent between 1960 and 2008 and rose to 40.87 per cent. As depicted in Table 2.2 above, the total percentage contribution of the agricultural sector to GDP improves from 26.3 per cent in 2000 to 40.24 per cent in 2011. The main category in the sector is crop as it recorded the highest contribution with 36.4 per cent as against 0.52 per cent and 40.87 per cent in the forestry and total agriculture sector, respectively in 2010 which makes agriculture the most dominant sector of the Nigerian economy. In Figures 2.1 and 2.2 displayed above, the food production index increased from 29.57 per cent in 1980 to 104 in 2011 as against an increase in the population growth rate from 2.84 per cent in 1980 to 2.52 per cent in 2011. Also, government size and GDP growth rate rose from 1.6 per cent and 2.5 per cent in 1986 to 2.6 and 7.4 per cent, respectively in 2012.

3. Literature Review

3.1 The Concept of Poverty

Oxfam (1998) in the Fundamental Review of the Strategic Intent (FROSI) opines that one approach is insufficient to define poverty in totality. It holds that in particular, there are four aspects: not having enough to live on, not having enough to build from, being excluded from wealth, and being excluded from the power to change things for the better. Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and lack of freedom. If you want to do something and have no power to do it, it is talauchi (poverty) (Narayan, 2000). The UN (2001) provides a broader definition of poverty as a human condition characterized by the sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights. Generally, there are three dominant categories of poverty. In the first view, poverty is seen as a severe deprivation of some basic human needs at the level of individual or household. The second view sees poverty as the failure to achieve basic capabilities such as being adequately nourished, living a healthy life, possession of skills to participate in economic and social life. The third view conceptualizes poverty to have both the physical and psychological dimension.

3.2 Measures of Poverty

Poverty measures have taken different methods in the past (Rowntree (1922), Atkinson, (1975), and Anyanwu, (1997). However, in recent times, the direct and indirect approaches of measuring poverty line have gained recognition. The direct approach, otherwise known as consumption approach, is specified in terms of minimum actual calorie intake of a person. Any individual or household consuming less than the acceptable minimum calorie intake is considered poor. This method has always been criticized by experts as it fails to capture the differences in physical requirements necessary to meet desired objectives and are subject to questionable value judgements about other people needs (Rede 1990). The direct approach is viewed by Englama & Bamidele (1997) as being constrained by taste factors, which make programming of a cost-minimizing consumption line difficult. The indirect method, also known as the income method, is based on the minimum income or expenditure

necessary for adequate nutritional diet or required basic needs. This is because a person's income is a major determinant of his standard of living. Higher income allows a person to invest in important things like land, education and health – and often to achieve social and political influence. For example Ravallion, Chen & Sangraula (2008) used the USD 1.25 per day indicator to show that sustainable poverty reduction is theoretically possible through financial transfers from higher to lower income people in all but the poorest of developing countries. One source of extra money known to be especially effective in reducing poverty is remittances from people who work abroad (Acosta, Fajnzylber & Lopez, 2007). The Indirect method presupposes that the pattern of consumption is uniform, otherwise it would be impossible to determine a specific level of income at which the typical consumer meets his/her basic needs (Englama & Bamidele 1997). Rede (1990), however, criticized this concept by arguing that interpersonal nutritional needs differ and there exists adoptive mechanism over time. The income measure of poverty is also not responsive to variations in the efficiency with which income is converted into satisfaction of people's own needs and wants.

Absolute poverty may, however, be measured by the number, or "headcount," H of those whose incomes fall below the absolute poverty line, Yp. When the headcount is taken as a fraction of the total population, N the headcount index could be defined as H/N. The poverty line is set at a level that remains constant in real terms so that one can chart the progress on an absolute level over time.

The United Nations has also introduced the use of such other indices as life expectancy, infant mortality, primary school enrolment ratio and number of persons per physician as factors to be taken into consideration in the measurement of poverty. The UNDP argued that human poverty should be measured in terms of three key definitions – of life (over 30 per cent of people in the least developed countries are unlikely to live beyond 40 years of age), of basic education (as measured by the percentage of adults who are illiterate), and of overall economic provisioning (measured by the percentage of people without access to health services and safe water plus the percentage of children under 5 who are underweight).

3.3 Empirical Literature

Various empirical studies on the relationship between agriculture and poverty are vast in the literature. The relationship is forged, according to DFID (2004) through the transmission mechanisms in the form of direct impact of improved agricultural performance on rural incomes; impact of cheaper food for both urban and rural poor; agriculture's contribution to growth and the generation of economic opportunity in the non-farm sector; and agriculture's fundamental role in stimulating and sustaining economic transition, as countries (and poor people's livelihoods) shift away from being primarily agricultural towards a broader base of manufacturing and services. On the contrary, while focusing on the quantitative approach to the subsisting relationship between agriculture and poverty, Bresciani & Valdes (2007) identify three transmission channels that connect the two as labour market; farm income; and food prices. While investigating the quantitative relevance of the various channels from six different country-case studies, through a theoretical framework the authors conclude that when both the direct and indirect effects of agricultural growth are taken into account, such growth is more poverty reducing than growth in non-agricultural sectors. In this light, Christiaensen & Demery (2007); Ravallion & Chen (2007); and World Bank (2008) suggests from their findings that growth originating in agriculture is on average significantly more poverty reducing than growth originating outside agriculture.

Specifically, Ravallion & Chen (2007) estimate that agricultural growth in China had four times greater impact on poverty reduction than growth in the secondary and tertiary sectors. An earlier study by Hasan & Quibria (2004) had examined parts of the larger South Asian region and found that agricultural growth was the leading driver of poverty reduction. Also, Montalvo & Ravallion (2009) find that the primary sector rather than the secondary (manufacturing) or tertiary sectors was the real driving force in China's spectacular success against absolute poverty. Cervantes-Godoy & Dewbre (2010) examine the importance of agricultural growth in poverty reduction in a sample of 25 countries that are selected on the basis of high initial rate of more than 10 per cent poverty at USD 2.00 per day; reductions in poverty rate in every year within 1980-2005 range; and availability of at least two years of survey data for calculating trends. Finding from the study shows that in comparison with the rest of the economy, agriculture appears especially powerful in lifting the poorer groups out of poverty. Furthermore, Grewal & Ahmed (2011) review the recent literature on the relationship between growth in agriculture and poverty reduction in China, India, Indonesia, South Africa and Vietnam. The study concludes that growth in agriculture and rural economy can still play a major role in poverty reduction in the developing countries. Lin, McKenzie, Piesse & Thirtle (not dated) corroborate the predominant findings of Thirtle, Irz, Lin, McKenzie & Wiggins (2001) that agricultural productivity growth can be expected to have an impact on poverty. While most empirical studies show that agricultural growth is relatively more important than growth in other sectors, a Time-series analysis for Taiwan reported in Warr & Wang (1999) found industrial growth to be most poverty reducing as compared to agriculture and other sectors. In corroboration, Gardner (2000) finds that gains in income from off-farm sources was the main reason rural poverty declined in the US from the 1960s. Ravallion & Datt (1996; 2002) found that the elasticity of rural headcount poverty with respect to agricultural growth in India was less than half that for non-agricultural sector growth. Similarly, an econometric analysis by Warr

(2002) based on pooled data for Indonesia, Thailand, Malaysia and the Philippines showed that the services sector has the greatest reduction on poverty. Loayza & Raddatz (2006), however, holds exceptions that differences in the sectoral GDP elasticities of poverty across countries, depend on the structure and institutional organization of their economies. This informs the opinions of Christiaensen & Demery (2007); and Ligon & Sadoulet (2008) which claim that common finding shows that poverty reducing powers of agriculture declines as countries get richer. In addition, Habito (2009) finds a rather weak evidence of any systematic relationship between agriculture and poverty in a study comprising 15 Asian countries.

4. Conceptual Framework and Methodology

4.1. A Conceptual Framework of the Poverty Line[1]

An important strand of the literature on welfare and poverty measurement has formalized the idea of what can be termed a "social subjective poverty line" (SSPL): the point in the income space which people tend to think they are not poor in a given society, and below which they tend to think they are poor. Underlying the idea of a SSPL is the premise that an individual's own idea of what it means to be "poor" depends on that individual's own level of living.

Poverty lines found at the country level do not explicitly claim to be SSPL's. More commonly they are based on the estimated cost of a set of basic consumption needs, typically anchored to nutritional requirements for good health. However, there is ample scope in the practice of poverty measurement to choose the parameters of a poverty line such that the resulting line is likely to be socially accepted in the given setting. Indeed, it would seem unlikely that any national poverty line would be accepted in practice if it differed significantly from the SSPL. In other words, it can be argued that the SSPL is the more fundamental concept underlying the "objective" poverty lines found in practice.

The postulate that the poverty line used in a given county is in fact the SSPL for that country. (In the empirical implementation it allows for a country-specific error term, encompassing idiosyncratic differences in the data and methods used as well as measurement errors.) Each individual has a subjective (personal) poverty line (z) that depends on own consumption or income (y). It is understood that this relationship is specific to a given setting (country or place) and, quite generally, one can postulate that the functional form relating z to y is country specific. It can be specialized further by postulating that the relationship depends on mean consumption in the country at large (C), which is taken to capture the social effect on personal subjective poverty lines. This relationship is written as:

$$z = \varphi(y, C) \text{ for } y \in [y^{min}, y^{max}] \quad (1)$$

4.2. Methodology

This study employs econometrics methodology of co-integration, Granger causality tests (Granger, 1969; 1986) and error correction mechanism (ECM). The stationarity of the data series was carried out through the both of the Augmented Dickey-Fuller (ADF) unit root test (Dickey & Fuller, 1979) and the Phillips-Perron (PP) unit root test. These were conducted at level and at first difference as depicted in Tables 4.1 and 4.2, respectively thereby implying an I(1) series. After the stationarity of the series was ascertained, a further step in line with Granger (1969) led to the determination of causality between each pair of the variables via the Granger causality test and the lag length selection criteria in appendix A1. Afterwards, the error correction technique (ect) was extracted for the eventual construction of the parsimonious model. Due to the different units of measurement, and for the reason of clarity of interpretation of empirical result, the variables were transformed to their natural logarithms. More importantly, because of the scarcity of data, the series covered the period 1986 to 2012.

4.2.1. Variable Description and Data Sources

The variables employed in this study resulted from the indirect approach or income method discussed above. Such that given the indicators of poverty, the poverty headcount ratio (phr) at $1.25 a day (PPP) (% of population). Population below $1.25 a day is the percentage of the population living on less than $1.25 a day at 2005 international prices. Agriculture is recognised in the literature to be important for eradicating poverty, as such, food production index (fpi) serves as proxy for agriculture: it covers food crops that are considered edible and that contain nutrients. Food and Agriculture Organization is the source of the data for fpi. Government spending (gvz) is also a variable that could reduce poverty as it stimulates effective demand in an economy. It is measured by all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure on national defence and security. Annual population growth rate (pgr) is another variable that could affect poverty incidence. A commensurate level of growth in the rate of population vis a vis physical capital is relevant for arresting the incidence of poverty, especially in a developing economy. Data for the variable were got from United Nations Population Division. GDP growth rate (gdpgr) is annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy

[1] This is substantially culled from Ravallion, Chen & Sangraula (2008)

plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. This variable could alleviate an individual's poverty headcount. Data for gdpgr and gvz were obtained from World Bank national accounts data, and OECD National Accounts data files.

4.2.2. Model Specification

Given that the impact of agricultural output on poverty in Nigeria is the crux of the study, the functional relationship among the variables is expressed in (2) as follows:

$$lnphr_t = f(lnfpi_t, lngvz_t, lnpgr_t, lngdpgr_t) \quad (2)$$

Thus, along the line of Ravallion et al (2008) and following that poverty is determined by various factors, the below modified model is specified to capture the effects of fiscal, demographic and agriculture indices on national poverty line in the form

$$lnphr_t = \beta_0 + \beta_1 lnfpi_t + \beta_2 lngvz_t + \beta_3 lnpgr_t + \beta_4 lngdpgr_t + \varepsilon_t \quad (3)$$

with the expectation that β_1, β_2,and β_4 show negative sign while β_3 is positive. β_0 is a constant as t is time and ε is the error term.

5. Empirical Result and Discussion

As depicted in Tables 5.1 and 5.2, the results of the ADF and PP, respectively show that lnphr and lngdpgr are stationary at the first difference while lngvz was stationary at level in both forms of test carried out on the series. However, the two tests report the stationarity of lnfpi and lnpgr at different stages. The ADF gives lnfpi to be stationary at 5 per cent and 10 per cent at level and intercept whereas PP shows first difference at 1 per cent, 5 per cent and 10 per cent level of significance. As regards lnpgr, ADF reports yet at the level and intercept but at the three standard levels of significance as against PP's result of first difference at 5 per cent and 10 per cent significance.

Table 5.1: Augmented Dickey-Fuller Unit Root Test on All Variables

Variable	Stage	Critical Value	1%	5%	10%
lnphr	**1st Difference**	-4.898979	-2.660720	-1.955020	-1.609070
lnfpi	**Level & Intercept**	-3.619777	-3.769597	-3.004861	-2.642242
lnpgr	**Level & Intercept**	-4.652168	-3.724070	-2.986225	-2.632604
lngvz	**Level: Trend & Intercept**	-3.987017	-4.356068	-3.595026	-3.233456
lngdpgr	**1st Difference**	-3.843935	-3.724070	-2.986225	-2.632604

Source: Author's Computation, 2014 using E-views 7

Furthermore, the error correction mechanism (ECM) model, as shown in appendix 2, shows that the error correction term (ECT) is statistically significant with negative coefficient as expected.

Table 5.2: Phillips-Perron Unit Root Test on All Variables

Variable	Stage	Critical Value	1%	5%	10%
lnphr	**1st Difference**	-4.898979	-2.660720	-1.955020	-1.609070
lnfpi	**1st Difference**	-3.824299	-2.660720	-1.955020	-1.609070
lnpgr	**1st Difference**	-2.015318	-2.660720	-1.955020	-1.609070
lngvz	**Level: Trend & Intercept**	-3.987017	-4.356068	-3.595026	-3.233456
lngdpgr	**1st Difference**	-2.551640	-2.660720	-1.955020	-1.609070

Source: Author's Computation, 2014 using E-views 7

The magnitude of the coefficient of the ECT, however, implies that the series adjust quickly to equilibrium in case of any short-term disequilibrium. The model further depicts a negative statistically significant effect of food production index and government size on poverty headcount ratio such that a hundred percentage point increase in food production index would bring about a 19.5 percentage reduction in poverty headcount ratio in Nigeria. In the same wise, a 100 percentage point increase in the government spending would also cause poverty headcount ratio to fall by 4.9 per cent in the country. Meanwhile, the results give a positive, but not significant, individual effect of population growth rate on poverty headcount ratio in the nation.

6. Concluding Remarks and Recommendations

The relationship that subsisted between poverty and agriculture has been empirically investigated by this study. By extension, the study also looked at the effects of population growth rate, government consumption spending and GDP growth rate on poverty in Nigeria. Findings from the investigation reveal that agriculture (food production index) and government consumption expenditure (government size) impacted negatively on poverty (poverty headcount ratio) over the period 1986-2012 in the country. By implication, it means that as food production as well as government size increased, the level of poverty dropped in the country. Although the impact of population growth rate on poverty headcount ratio was insignificant, the relationship was, however, positive.

In essence, given the fact that an inverse significant relationship was established between poverty and food

production index, the government of Nigeria would need to do more in the agriculture sector in order to boost the production of food. An increased food production would translate to putting food on the table of the common man who ordinarily lives below USD 1.25 per day and the national poverty line. Also, government would need to direct its spending more on productive and capital projects. Such spending is expected to create additional jobs and hence income for an average Nigerian who has been languishing in poverty over the years in the country. As a matter of fact, government spending is an injection into the circular flow of income in an economy such that, if judiciously spent, consumption would improve with increased output. In the end, society would fare better with reduced poverty headcount ratio.

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Appendix A1: Lag Length Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LNPHR LNFPI LNPGR LNGVZ LNGDPGR
Exogenous variables: C
Date: 03/02/14 Time: 18:10
Sample: 1986 2012
Included observations: 25

Lag	LogL	LR	FPE	AIC	SC	HQ
0	125.2259	NA	4.58e-11	-9.618069	-9.374294	-9.550456
1	265.8253	213.7111*	4.62e-15	-18.86602	-17.40337*	-18.46034
2	298.8427	36.97957	3.20e-15*	-19.50742*	-16.82589	-18.76368*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Appendix A2: The Parsimonious (Error Correction) Model

Dependent Variable: D(LNPHR)
Method: Least Squares
Date: 03/02/14 Time: 18:55
Sample (adjusted): 1987 2012
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNFPI)	-0.195194	0.098153	-1.988681	0.0593
D(LNPGR)	0.438093	0.764459	0.573076	0.5724
D(LNGVZ)	-0.049952	0.015363	-3.251457	0.0037
ECT(-1)	-0.657626	0.193891	-3.391729	0.0026

R-squared	0.471822	Mean dependent var	0.008905
Adjusted R-squared	0.399798	S.D. dependent var	0.039847
S.E. of regression	0.030871	Akaike info criterion	-3.977365
Sum squared resid	0.020966	Schwarz criterion	-3.783811
Log likelihood	55.70574	Hannan-Quinn criter.	-3.921628
Durbin-Watson stat	1.921093		